

A new species of *Hydropsyche* of the *pellucidula*-group*

(Insecta, Trichoptera, Hydropsychidae)

By Renato De Pietro

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The adult (♂, ♀) and larval (5th instar) characters of *Hydropsyche morettii*, spec. nov. belonging to the *pellucidula*-group are described and illustrated. Information on ecology and phenology is also given.

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Introduction

During my investigations on the genus *Hydropsyche* in Sicily, many populations of a new species belonging to the *pellucidula*-group (Marinkovic-Gospodnetic 1979, Botosaneanu & Giudicelli 1981, Malicky 1983, Moretti 1991, Pitsch 1993a) were found. The new species is closely related to *H. pellucidula* (Curtis, 1834). Electrophoretic investigations on the populations of these two taxa (De Pietro et. al. in prep.) confirm their differentiation at the specific level.

H. pellucidula, although previously mentioned for the island (Moretti & Cianficconi 1981, Botosaneanu et al. 1986, Cianficconi & Moretti 1990, 1991), was never found, despite my investigation in Sicily covered many streams. Therefore, citations of *H. pellucidula* for Sicily are to be referred probably to the new species.

Research extended also to many centro-meridional Italian streams, suggests that the new species distribution extends from Sicily to Campania and that *H. pellucidula* has in this region its southernmost limit. The coexistence of *H. morettii* and *H. pellucidula* has been ascertained for two sites of the rivers Sele and Tanagro in Campania.

Hydropsyche morettii, spec. nov.

Types. Holotype: ♂, Sicilia, F. San Paolo, Francavilla di Sicilia 23/6/94 (ZSM - Zoologische Staatssammlung München). - Allotype: ♀, same data (ZSM).

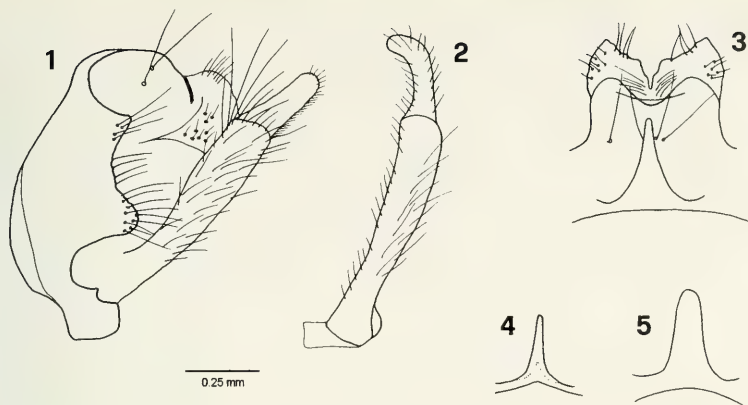
Examined Material.

For each collecting site the stream, elevation, closest inhabited area and abbreviation of the province are indicated. The adult specimen obtained by the rearing of larvae or pupae are placed within parenthesis; L stands for larvae and P for pupae. The material is partly preserved in ZSM, partly in coll. De Pietro, Dipartimento di Biologia Animale, Università di Catania.

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Coordinator: Prof. D. Caruso.

Silicy

- F. Fiumedinisi, 130 m - Fiumedinisi (ME): 15/12/92: 39 LL; 20/7/93: (9♀♀), 5 PP, 28 LL; 23/6/94: (1♂, 1♀), 2 PP, 4 LL.
- F. Fiumedinisi, 160 m - Fiumedinisi (ME): 16/7/92: 3 LL; 15/12/92: (1♂), 28 LL; 20/7/93: (1♂, 5♀♀), 35 LL; 21/9/93: (4♀♀); 17/1/94: 1 L; 11/8/94: (3♂♂), 2 PP, 18 LL; 7/10/94: (3♀♀), 2 PP, 23 LL.
- T. Santissima, 320 m - Fiumedinisi (ME): 15/12/92: 7 LL; 4/12/93: 5 LL; 17/1/94: 3 LL; 4/3/94: 1 L; 23/6/94: 2 LL.
- V. Soldato, 620 m - Fiumedinisi (ME): 27/8/92: 1 L; 15/12/92: 1 L; 20/7/93: 1 L; 21/9/93: 1 P, 4 LL; 17/1/94: 1 L; 7/5/94: 1 L; 23/6/94: 1 L; 7/10/94: 1 L.
- T. Capitanello, 400 m - Fiumedinisi (ME): 20/7/93: 4 LL; 21/9/93: 9 LL; 11/8/94: 1 L.
- T. Vacco, 350 m - Fiumedinisi (ME): 26/8/92: 2♂♂, 3 LL; 15/12/92: (1♀), 5 LL; 20/5/93: 1 L; 20/7/93: (1♀), 26 LL; 21/9/93: 26 LL; 11/8/94: 9 LL; 7/10/94: 5 LL.
- F. di Colonnina, 400 m - Fiumedinisi (ME): 15/12/92: 20 LL; 20/5/93: 1♂; 20/7/93: 1 P, 3 LL; 21/9/93: 10 LL.
- F. Mela, 130 m - S. Lucia del Mela (ME): 12/4/95: 3 PP, 5 LL.
- T. di Antillo, 270 m - Antillo (ME): 16/7/92: 8 LL; 23/2/93: 4 LL; 20/7/93: 3 LL.
- T. di Antillo, 470 m - Antillo (ME): 23/2/93: 1 L.
- Aff. T. di Antillo, 500 m - Antillo (ME): 23/2/93: 3 LL.
- Fra d'Agrò, 140 m - Mita (ME): 23/2/93: 6 LL.
- F. Alcantara, 750 m - Randazzo (CT): 10/10/92: 7 LL.
- F. Alcantara, 480 m - Moio Alcantara (ME): 28/6/92: 39 LL; 10/10/92: (1♀), 4 LL.
- F. Alcantara, 90 m - Mitogio (ME): 28/6/92: 17 LL.
- F. Alcantara, 50 m - Calatabiano (CT): 5/2/93: 17 LL.
- F. Alcantara, 0,5 m - Giardini Naxos (ME): 16/7/92: 2 LL; 5/2/93: 3 LL.
- F. San Paolo, 220 m - Francavilla di Sicilia (ME): 28/6/92: 1♂, 3 LL; 8/1/93: 20 LL; 25/6/93: 5 PP, 31 LL; 15/1/93: 28 LL; 4/2/94: 1 L; 18/5/94: 9 LL; 11/8/94: 1 P, 1 L.
- F. San Paolo, 350 m - Francavilla di Sicilia (ME): 28/6/92: 13 LL; 8/1/93: 7 LL.
- F. San Paolo, 450 m - Francavilla di Sicilia (ME): 28/3/92: 2 LL; 28/6/92: 1 P, 31 LL; 10/10/92: 7 LL; 8/1/93: 19 LL; 3/4/93: 2 LL; 25/6/93: 1 P, 21 LL; 9/9/93: (3♀♀), 1 P, 9 LL; 15/11/93: 10 LL; 4/2/94: 3 LL; 26/3/94: 3 LL; 18/5/94: 1 P, 1 L; 23/6/94: (1♂, 1♀), 1 P, 3 LL; 11/8/94: 8 LL.
- Aff. F. San Paolo, 465 m - Francavilla di Sicilia (ME): 8/1/93: 4 LL; 3/4/93: 5 LL; 25/6/93: 6 LL; 9/9/93: 1 L; 15/11/93: 3 LL; 23/6/94: 3 LL.
- F. di Mancina, 470 m - Francavilla di Sicilia (ME): 28/6/92: 8 LL; 25/6/93: 5 LL.
- Fso Scavuzzo, 585 m - Malvagna (ME): 28/3/92: 8 LL; 28/6/92: 11 LL; 10/10/92: 4 LL; 8/1/93: 4 LL; 3/4/93: 10 LL; 25/6/93: 1♂, 3 LL; 9/9/93: 2 LL; 15/11/93: 3 LL; 26/3/94: 1 L; 23/6/94: 2 LL.
- F. so Scavuzzo, 670 m - Malvagna (ME): 28/6/92: 2 LL; 15/11/93: 2 LL; 23/6/94: 1 L; 11/8/94: 1 L.
- Aff. F. so Scavuzzo, 630 m - Malvagna (ME): 3/4/93: 2 LL; 15/11/93: 1 L; 23/6/94: 2 LL; 7/10/94: 1 L.
- T. Licopeti, 750 m - Roccella Valdemone (ME): 10/10/92: 1 L; 14/4/93: 1 L; 9/9/93: 4 LL.
- T. Petrolo, 320 m - Graniti (ME): 8/1/93: 2 LL.
- T. San Cataldo, 250 m - Motta Camastra (ME): 14/4/93: 1 L.
- F. Flascio, 940 m - Randazzo (CT): 24/10/92: 26 LL.
- F. Simeto, 460 m - Bronte (CT): 17/11/92: 95 LL; 27/5/93: (1♂, 3♀♀), 5 PP, 13 LL.
- F. Simeto, 350 m - Adrano (CT): 17/11/92: (1♂), 117 LL.
- F. Simeto, 90 m - Paternò (CT): 12/6/93: 2 PP, 6 LL; 10/8/93: (1♂, 1♀), 1 P, 60 LL; 17/5/94: 1 L; 18/6/94: 2 PP.
- F. Simeto, 25 m - Motta S. Anastasia (CT): 12/6/93: (1♂), 5 LL; 18/6/94: 2 PP; 17/5/94: 1 L.
- T. Saracena, 1180 m - Maniace (CT): 5/8/92: 2♀♀, 2 LL; 11/9/93: 2 LL.
- Aff. T. Saracena, 1285 m - Maniace (CT): 23/4/94: 1 L.
- T. Saracena, 750 m - Maniace (CT): 1/9/92: 68 LL; 24/10/92: 44 LL; 17/11/92: 31 LL; 8/6/93: 2 PP, 18 LL; 2/7/94: (1♂, 1♀), 8 LL.
- T. Martello, 1000 m - Petrosino (CT): 25/5/94: 2 LL; 30/5/94: 2 LL.
- T. Martello, 850 m - Petrosino (CT): 25/5/94: (1♀), 11 LL.
- T. Martello, 685 m - Petrosino (CT): 30/5/94: (3♀♀), 5 LL.
- F. Serravalle, 570 m - Bolo Fiorentino (ME): 17/11/92: 63 LL; 27/5/93: 2 PP, 41 LL.
- F. di Cerami, 420 m - Agira (EN): 18/2/93: 5 LL.
- F. di Caltagirone, 60 m - Ramacca (CT): 11/1/93: 3 LL.
- F. Gornalunga, 360 m - Aidone (EN): 3/8/93: (1♂), 1 L.
- T. Belluzza, 100 m - Villasmundo (SR): 17/6/93: 1 L; 17/8/93: 1 L.
- Fra Grano, 320 m - Sortino (SR): 6/11/92: 2 LL.
- F. Anapo, 370 m - Cassaro (SR): 6/11/92: 19 LL; 17/8/93: 2 LL; 28/9/93: 45 LL; 8/12/93: (1♀), 7 LL; 21/1/94: (1♀), 10 LL; 11/3/94: 5 LL; 30/4/94: (1♀), 3 PP, 2 LL; 10/6/94: (1♂), 39 LL; 25/7/94: (3♂♂, 3♀♀), 5 PP, 78 LL; 24/9/94: (1♂), 3 PP, 36 LL.
- F. Anapo, 70 m - Floridia (SR): 6/11/92: 1♀, 43 LL.
- T. Passanetello, 300 m - Francofonte (SR): 1/12/92: (1♂, 1♀), 2 LL.
- F. Vizzini, 320 m - Vizzini (CT): 14/3/93: (1♀), 49 LL.



Figs 1-5. *Hydropsyche morettii*, spec. nov., ♂ genitalia. 1. Lateral view. 2. Right clasper, ventral view. 3. Dorsal view. 4-5. carina, dorsal view. 1-3. Sicily, F. San Paolo. 4. Sicily, F. Simeto. 5. Sicily, T. Vacco.

- F. Amerillo, 330 m - Monterosso Almo (RG): 14/3/93: 27 LL.
- F. Amerillo, 440 m - Monterosso Almo (RG): 14/3/93: 8 LL.
- F. Dirillo, 280 m - Acate (RG): 14/3/93: 2 LL.
- F. Irminio, 550 m - Giarratana (RG): 14/3/93: 2 LL.
- F. Verdura, 30 m - Ribera (AG): 29/4/93: 7 LL.
- F. Sosio, 190 m - S. Carlo (AG): 29/4/93: (3♀), 59 LL.
- F. Sosio, 590 m - Prizzi (PA): 29/4/93: 16 LL.
- F. Platani, 410 m - Castronuovo (PA): 22/4/95: 65 LL.
- F. Imera settentrionale, 240 m - Scillato (PA): 15/9/94: (1♂, 1♀), 28 LL.

Calabria

- F. ra di Boscaino, 110 m - Castellace (RC): 15/10/93: 2 PP, 12 LL.
- T. Diverso, 350 m - S. Giorgia (RC): 15/10/93: 7 LL.
- V. del Salice, 550 m - S. Giorgio (RC): 13/10/93: (1♀), 3 PP, 23 LL.
- F. ra di Plati, 430 m - Plati (RC): 12/10/93: 7 LL.
- T. Abbruschiato, 430 m - Cirella (RC): 12/10/93: (1♀), 1 P, 8 LL.
- F. ra Novito, 130 m - Agnana (RC): 14/10/93: (2♂♂, 8♀♀), 7 PP, 46 LL.
- F. ra Novito, 320 m - Canolo (RC): 14/10/93: 10 LL.
- F. Marepotamo, 80 m - Melicucca (RC): 14/10/93: 8♂♂, 21♀♀, 2 PP, 28 LL.
- T. Mentaro, 200 m - Mantirano (CZ): 6/5/93: 1♀, 3 PP, 5 LL.
- F. Crati, 80 m - Bisignano (CS): 17/7/94: (1♂, 2♀♀), 1 P, 5 LL.
- F. Lao, 190 m - Papasidero (CS): 28/9/94: (2♂♂, 4♀♀), 10 PP, 47 LL.
- T. Santo Nocaio, 210 m - Papasidero (CS): 28/9/94: 2 PP, 6 LL.

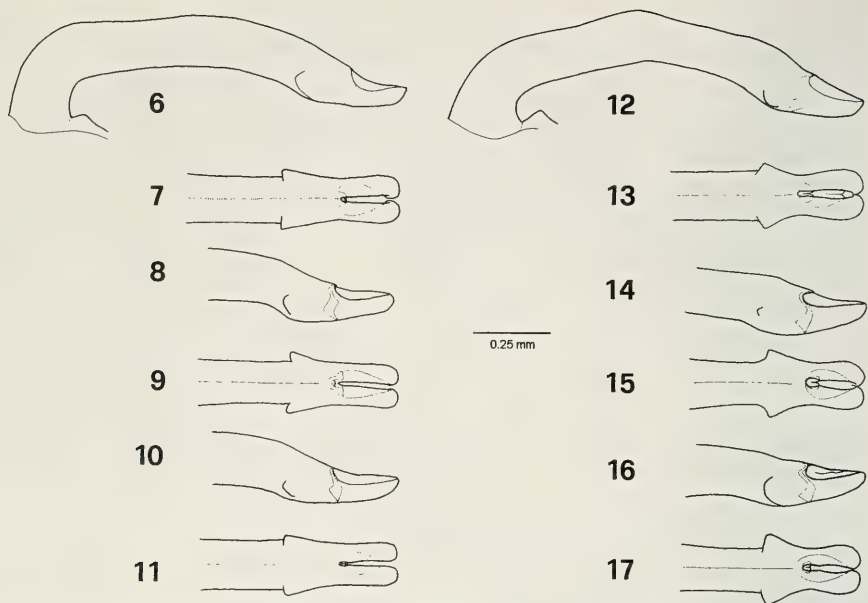
Campania

- F. Calore, 500 m - Buonabitacolo (SA): 29/9/94: (2♂♂, 1♀), 2 PP, 22 LL.
- F. Tanagro, 210 m - Auletta (SA): 29/9/94: (6♂♂, 10♀♀), 24 PP, 4 LL.
- F. Sele, 150 m - Contursi Bagni (SA): 13/7/94: 1 L.

Description

Length of the anterior wings: ♂ 8.59-12.19 mm, ♀ 8.75-14.37 mm. Variable wing colouring: uniformly light or dark brown.

♂ genitalia (Figs 1-11). Dorsally, carina of ninth segment, with variable shape: triangular, more or less wide or very thin. Depressions of ninth and tenth segments large with indistinct boundary between them. Throughout its length aedeagus width is the same; laterally, the aedeagus' central area without dorsal hump or, if present, barely discernable; basal portion of aedeagus forms approximately a right angle. Aedeagus apex elongate and flattened; aedeagus teeth, more or less pointed, basally oriented, of variable



Figs 6-17. Aedeagus, lateral and ventral view. 6-11. *Hydropsyche morettii*, spec. nov. 12-17. *Hydropsyche pellucidula* (Curtis, 1834). 6-7. Sicily, F. San Paolo. 8-9. Sicily, F. Anapo. 10-11. Calabria, F. Lao. 12-15. Campania, F. Sele. 16-17. Lazio, F. Liri.

size but generally small. Lateral lobes of aedeagus parallel or slightly convergent at distal portion. Harpago with flattened extremity. Coxopodite length: 0.67-0.85 mm. Harpago length: 0.25-0.33 mm. Ratio harpago/coxopodite: 1/2.20-1/3.23.

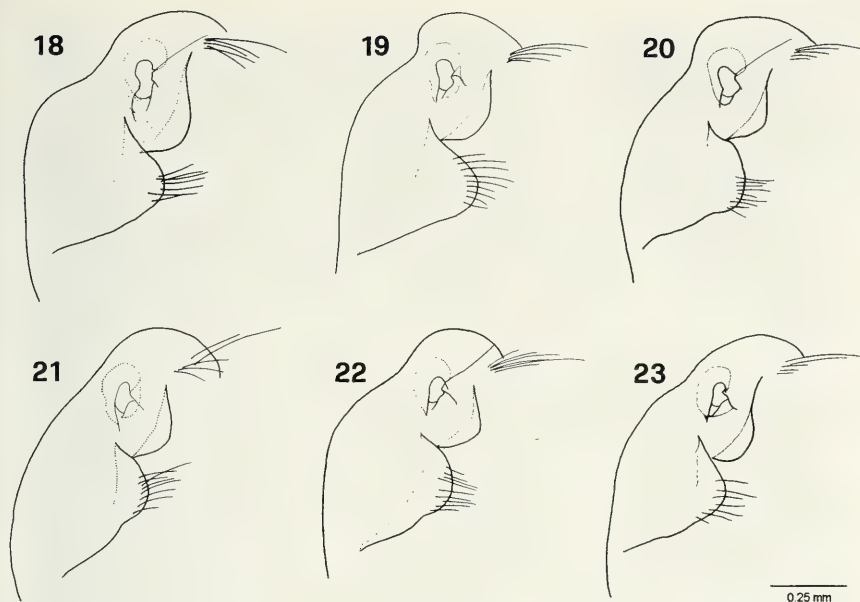
♀ genitalia (Figs 18-20). Dorsal lobe of ninth segment short with wide base. Ventral lobe variable: rounded to pointed. Harpago receptacle foramen elongate dorsoventrally. Foramen anterior margin more or less inwardly curved; in specimens from Calabria and Campania it is less evident but even within Sicilian populations there may be extreme examples of this character.

Larvae (description refers to 5th instar, Figs 24-26). Frontoclypeus nearly triangular. Frontoclypeal lateral margins converging back with a more or less accentuated indentation at about same level of median light spots; frontoclypeal anterior margin straight. Frontoclypeal anterior light spot variable: absent to large, sometimes fused with median spots. Median light spots variable: either small, circular, barely visible or not, or elongate, visible, oriented obliquely. If elongate, there is always a darker lateral portion between the frontoclypeal margin and the spot. The pattern with small, circular, barely visible, median light spots is found more frequently in Sicily and Calabria while that with elongate light spots is predominant in the populations from Campania. Posterior margins of the central dark patch's lateral ramifications (Y-shaped) - placed between the two median light spots - always curved. Posterior light spot normally poorly developed and barely visible; more frequently the populations from Campania have a more developed posterior light spot (V-shaped).

Dorsally, dark area of head extends lateroventrally posterior the eyes without leaving any light portion at lateral margins of head. Ventral area of head variably patterned and shaped. Gula with thin elongate lateral lobes and a central protuberance. Median posterior prosternites wide, quadrangular; clearly visible lateral ones.

There are noticeable differences in the dimensions of specimen belonging to different populations: the specimen from the streams of the Iblei Mountains (Sicily) are the largest while those from the Aspromonte Mountains (Calabria) are the smallest -with other populations intermediate.

Ecology. *H. morettii* is the most widespread species in Sicily; it is present in almost all streams with preference for the middle and terminal portions (metarhithral-epipotamal), except for those that dry



Figs 18-23. ♀ genitalia, lateral view. 18-20. *Hydropsyche morettii*, spec. nov. 21-23. *Hydropsyche pellucidula* (Curtis, 1834). 18. Sicily, F. San Paolo. 19. Calabria, F. Crati. 20. Campania, F. Tanagro. 21-22. Campania, F. Sele. 23. Campania, F. Tanagro.

up or have low flows. It has been found from sea level to about 1300 m. It is present also in some streams with antropogenic changes (sewage inputs, hydraulic regulation, etc.).

Phenology. Adult and pupal specimen can be found from April to November. At the collecting sites at which it is abundant, mature larva are found almost all year long; in such cases there often is the absence of mature larvae only in connection with periods of emergence. In some sites there may be bivoltine cycles.

Chorology. The presence of this species has been ascertained for Sicily, Calabria and Campania (Fig. 30). Further investigation is necessary for the definition of its actual distribution.

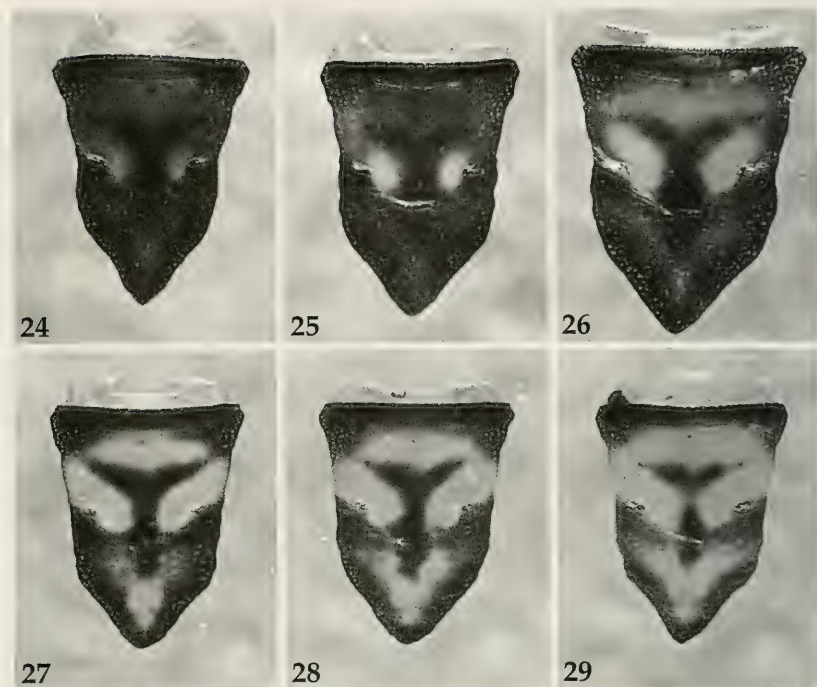
Derivatio nominis. This species is dedicated to Prof. G.P. Moretti, to whom the knowledge of the Italian Trichoptera fauna is mostly due.

Discussion

The new species is closely related to *H. pellucidula*. Of this species larvae and adult Italian specimens, especially from Campania, were examined as well as two German male adult specimens kindly loaned by Dr. W. Tobias.

H. morettii can be differentiated from *H. pellucidula* in the male, by the longer and more flattened aedeagus apex; the aedeagus teeth are basally oriented. Also, the basal angle of the aedeagus is smaller than that in *H. pellucidula*; laterally the aedeagus is straight, with no hump or only a slightly discernable one, while in *H. pellucidula* it is curved with a pronounced dorsal hump. In the females the anterior margin of the receptacle foramen is inwardly curved and not so in *H. pellucidula*. Generally, the dorsal lobe of the IX segment is shorter than in *H. pellucidula*. The pattern of the forewings is more uniform than in *H. pellucidula*.

Of many species of *Hydropsyche* the larval instars are unknown and often larval characters variability makes identification uncertain (Bournaud et al. 1982, Pitsch 1993b). Also *H. morettii* larvae show considerable variation; however, Sicilian larval populations cannot be mistaken for *H. pellucidula* for their characteristic pattern (light and dark spots) of the frontoclypeus and particularly for their



Figs 24-29. Frontoclypeus. 24-26. *Hydropsyche morettii*, spec. nov. 27-29. *H. pellucidula* (Curtis, 1834). 24. Sicily, F. San Paolo. 25. Sicily, F. Fiumedinisi. 26. Sicily, F. Anapo. 27. Campania, F. Tanagro. 28. Campania, F. Sele. 29. Lazio, F. Liri.

(generally) barely visible median light spots; instead, the pattern of the populations of Campania is more similar to that of *H. pellucidula* in which the median light spots reach the frontoclypeal margin and the posterior margins of the central dark patch's lateral ramifications - placed between the two median light spots - are not curved. However, central Italian populations of *H. pellucidula* can have a different pattern.

With respect to the other species of the *pellucidula*-group that appear morphologically more similar, *H. morettii* differs from *H. botosaneanui* Marinkovic-Gospodnetic, 1966 for the wider endotheca that reaches the apex and for the not prolonged ninth and tenth segments. In the female the receptacle foramen of the harpago is more elongated than in *H. botosaneanui*. The larval instars of *H. botosaneanui* are unknown.

H. morettii differs from *H. incognita* Pitsch, 1993 for the following characters: the shape of the aedeagus apex, seen laterally, is more elongate and pointed; the aedeagus teeth are less prominent and basally oriented; the thin endotheca is more distally elongated; the smaller basal angle of the aedeagus; throughout its length the straight aedeagus has the same width. The female of *H. incognita* has yet to be described. Pitsch's larval description of *H. incognita* (1993a) is not sufficient for the differentiation from the populations of *H. moretti* from Campania.

The differentiation of *H. dinarica* Marinkovic-Gospodnetic, 1979 from *H. morettii* is not difficult for both larvae and adults.

Acknowledgements

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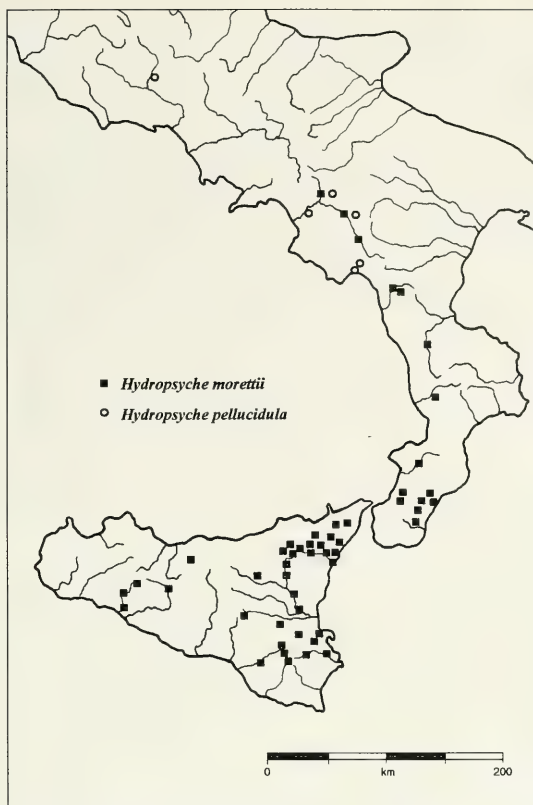


Fig. 30. Collecting sites of *Hydropsyche moretii*, spec. nov. and *H. pellucidula* (Curtis, 1834) in southern Italy.

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